

## Water Quality Trading and Related Issues

**41. Agricultural nonpoint source pollution and economic incentive policies: Issues in the reauthorization of the Clean Water Act --- Water quality.**

Malik, Arun S.; Larson, Bruce A.; Ribaldo, Marc. ; and United States. Dept. of Agriculture. Economic Research Service. Resources and Technology Division. Washington, DC: U.S. Dept. of Agriculture, Economic Research Service, Resources and Technology Division; iv, 14 p. (1992)

*Notes:* Cover title. "November 1992"--P. iii. Includes bibliographical references (p. 12-14).

*NAL Call #:* aTD428.A37M34-1992

*Descriptors:* Agricultural pollution---Government policy---United States/ Water Pollution ---Government policy---United States

This citation is from AGRICOLA.

**42. Albemarle-Pamlico: Case study in pollutant trading -- Most of the nutrients came from nonpoint sources.**

Hall, J. and Howett, C.

*EPA Journal* 20 (1/2): 27-29. (1994)

*NAL Call #:* TD171.U5; *ISSN:* 0145-1189

*Descriptors:* estuaries/ water quality/ pollutants/ nutrients/ nitrogen/ point sources/ nutrient sources/ environmental degradation/ watershed management/ pollution control/ North Carolina/ nonpoint sources

This citation is from AGRICOLA.

**43. At the Crossroads of Control.**

Willey, Z.

*Agricultural Engineering* 72 (3): 12-15. (1991).

*Notes:* 2 fig, 1 tab.

*Descriptors:* Agricultural management/ Economic analysis/ Nonpoint pollution sources/ Water pollution/ Water quality/ Environmental fate

This citation is from AGRICOLA.

**44. Building markets for tradable pollution rights: Ohio River Valley Water Sanitation Commission (ORANSCO), Federal Water Pollution Control Act of 1972.**

Maloney, M. T. and Yandle, B.

In: *Water rights: Scarce resource allocation, bureaucracy, and the environment/* Anderson, T. L.; San Francisco, Calif.: Pacific Institute for Public Policy Research, 1983. pp. 283-320.

*Notes:* ISBN: 0884103897

*NAL Call #:* KF5569.A2W37

This citation is from AGRICOLA.

**45. Can a watershed be managed?**

Johnson, C. R.; Kaunelis, V. P.; and Cave, K. A.

*Water Environment and Technology* 12 (6): 31-33. (2000)

NAL Call #: TD419.W37; ISSN: 1044-9493

*Descriptors:* Catchment hydrology/ Nonpoint source pollution/ Watersheds/ Michigan

This citation is from AGRICOLA.

**46. Charting a new course: Pollutant trading can play a key role in improving water quality.**

Podar, Mahesh and Kashmanian, Richard M.

*Forum for Applied Research and Public Policy* 13: 40-44. (Fall 1998); ISSN: 0887-8218

*Descriptors:* Environmental policy/ Economics/ Water pollution/ Pollution control/

Water quality/ United States

This citation is from AGRICOLA.

**47. Chesapeake nutrient trading needs CWA funding.**

*Water Environment and Technology* 7 (5): 30-34. (1995)

NAL Call #: TD419.W37; ISSN: 1044-9493

*Descriptors:* Environmental programs/ Clean Water Act/ Chesapeake Bay/

Water quality

This citation is from AGRICOLA.

**48. A classroom experiment about tradable permits.**

Kilkenny, M.

*Review of Agricultural Economics* 22 (2): 586-606. (Fall 2000-Winter 2000)

NAL Call #: HD1773.A3N6; ISSN: 1058-7195.

*Notes:* Includes references.

*Descriptors:* rural communities/ permits/ experiments/ teaching methods/ externalities/

costs/ college students/ markets

This citation is from AGRICOLA.

**49. Controlled trading of pollution permits.**

Russell, C. S.

*Environmental Science and Technology* 15 (1): 24-28. (1981)

NAL Call #: TD420.A1E5; ISSN: 0013-936X

This citation is from AGRICOLA.

**50. Cost-effective point-nonpoint trading: An application to the Susquehanna River Basin.**

Horan, R. D.; Abler, D. G.; Shortle, J. S.; and Carmichael, J.

*Journal of the American Water Resources Association* 38 (2): 467. (2002)

NAL Call #: GB651.W315; ISSN: 1093-474X

*Descriptors:* Nonpoint source pollution/ Water quality/ Environmental programs/

Cost benefit analysis/ Watersheds/ Pennsylvania

This citation is from AGRICOLA.

**51. Design and Legality of an Innovative Approach to Nonpoint Source Control.**

Dudek, D. and Wendel, H.

In: Contributed papers and abstracts for the conference on water, laws and management. (Held 17 Sep 1989-22 Sep 1989 at Tampa, Florida.)

Middleburg, Va.: American Water Resources Association; 1989.

*Notes:* AWRA special publication No.89-4.

*NAL Call #:* TD223.A1C66

*Descriptors:* Nonpoint source pollution/ Water pollution/ Water quality/ Environmental programs/ Colorado

This citation is from AGRICOLA.

**52. Differences in social and public risk perceptions and conflicting impacts on point/nonpoint trading ratios.**

Horan, R. D.

*American Journal of Agricultural Economics* 83 (4): 934-941. (Nov. 2001)

*NAL Call #:* 280.8-J822; *ISSN:* 0002-9092 [AJAEB].

*Notes:* Includes references.

*Descriptors:* water quality/ pollution control/ risk/ social costs/ ratios/ stochastic processes/ federal programs/ equations/ United States

*Abstract:* If stochastic nonpoint pollution loads create socially costly risk, then an economically optimal point/nonpoint trading ratio-the rate point source controls trade for nonpoint controls-is adjusted downward (a risk reward for nonpoint controls), encouraging more nonpoint controls. However, in actual trading programs, ratios are adjusted upward in response to nonpoint uncertainties (a risk premium for nonpoint controls). This contradiction is explained using a public choice model in which regulators focus on encouraging abatement instead of reducing damages. The result is a divergence of public and social risk perceptions, and a trading market that encourages economically suboptimal nonpoint controls.

This citation is from AGRICOLA.

**53. Draft framework for watershed-based trading.**

Environmental Protection Agency, Office of Water

Washington, D.C.: U.S. Environmental Protection Agency. (1996)

*Notes:* EPA/800-R-96-001.

<http://www.epa.gov/owow/watershed/framwork.html>

*Descriptors:* Watersheds/ Water quality/ Environmental programs/ Clean Water Act

This citation is from AGRICOLA.

**54. Economic incentives for agricultural nonpoint source pollution control.**

Malik, A. S.; Larson, B. A.; and Ribaudo, M.

*Water Resources Bulletin* 30 (3): 471-480. (May 1994-June 1994)

*NAL Call #:* 292.9-Am34; *ISSN:* 0043-1370 [WARBAQ].

*Notes:* Includes references.

*Descriptors:* water pollution/ pollution control/ environmental legislation/ incentives/ economic policy/ Clean Water Act

*Abstract:* The limited success of command-and-control policies for reducing nonpoint source (NPS) water pollution mandated under the Federal Water Pollution Control Act

(FWPCA) has prompted increased interest in economic incentive policies as an alternative control mechanism. A variety of measures have been proposed ranging from fairly minor modifications of existing policies to substantial revisions including watershed-wide polices that rely on economic incentives. While greater use of economic incentive policies, such as environmental bonds and point/nonpoint source trading is being advocated in the reauthorization of the CWA, the expected effects of individual proposals will be modest. The characteristics of NPS pollution, namely uncertainty and asymmetrical information, underscores that there is no single, ideal policy instrument for controlling the many types of agricultural NPS water pollution. Some of the usual incentive-based policies, such as effluent taxes, are not well suited to the task. Individual incentive policies proposed for the reauthorized CWA, such as pollution trading or deposit/refund systems, are not broadly applicable for heterogeneous pollution situations. Economic incentive policies may be appropriate in some cases, and command-and-control policies will be preferable in others and may in fact complement incentive policies.

This citation is from AGRICOLA.

#### **55. Efficiency of U.S. conservation-compliance program.**

Govindasamy, R. and Huffman, W.

*Agricultural Economics* 8 (2): 173-185. (Feb. 1993)

NAL Call #: HD1401.A47; ISSN: 0169-5150 [AGECE6].

Notes: Includes references.

Descriptors: erosion/ control/ erosion control/ soil conservation/ federal programs/ opportunity costs/ losses from soil/ equations/ production costs/ profits/ soil types/ mathematical models/ efficiency/ United States/ Iowa/ cost functions

Abstract: Under the conservation-compliance program, most of the individual producers are forced to cut their soil erosion to 7 t per acre annually irrespective of the marginal cost of controlling soil erosion. In a system where coupons to a ton of soil loss were issued to producers and traded, the marginal cost of controlling soil loss within each soil type and across different soil types would be equalized. An instrumental variable procedure was used to determine the effect of soil erosion on net profits. The results for Iowa show that there is considerable difference in the marginal opportunity cost of controlling soil erosion between soil types. By assigning one ton of erosion to Iowa soil type Downs (5-10% slope) instead of Clarion (2-5% slope), there is a savings of \$5.00 per acre for the society as a whole. The tradable coupon system is not only efficient, but will also bring in more land under soil conservation.

This citation is from AGRICOLA.

#### **56. Estuarine Management from a Global Economic Perspective.**

Bundy, M. M.

*Water Science and Technology* 26 (12): 2735-2739. (1992)

NAL Call #: TD420.A1P7

Descriptors: Estuaries/ Water quality/ Environmental programs/ Watersheds/ Chesapeake Bay

This citation is from AGRICOLA.

**57. Feasibility of point-nonpoint source trading for managing agricultural pollutant loadings to coastal waters.**

Crutchfield, S. R.; Letson, D.; and Malik, A. S.

*Water Resources Research* 30 (10): 2825-2836. (Oct. 1994)

NAL Call #: 292.8-W295; ISSN: 0043-1397 [WRERAQ].

Notes: Includes references.

Descriptors: pollutants/ agriculture/ water pollution/ point sources/ pollution control/ water quality/ watersheds/ coastal areas/ feasibility/ United States/ nonpoint source pollution / point source pollution

Abstract: A recent focus of water quality policy discussions has been the trading of pollution abatement between point and nonpoint sources. Point-nonpoint trading would allow point sources to sponsor nonpoint source controls rather than install further controls of their own. If nonpoint source loadings are significant and the marginal costs of their control are lower than for additional point source controls, water quality goals could be met at lower cost with trading. We isolate difficulties particular to incentive policies such as point-nonpoint trading and then screen coastal watersheds for those satisfying conditions that play a major role in determining whether trading can improve water quality. We follow the recent Coastal Zone Act Reauthorization Amendments in emphasizing agriculture, the single largest cause of nonpoint source pollution. Our screening analysis provides an initial, empirical assessment of the feasibility of trading for managing agricultural land use to protect coastal water quality. We also illustrate the additional analysis required to quantify the potential for successful trading in those watersheds which meet our screening criteria.

This citation is from AGRICOLA.

**58. Fertile ground: Nutrient trading's potential to cost-effectively improve water quality.**

Faeth, Paul.

Washington, DC: World Resources Institute; viii, 50 p.: ill., map. (2000)

Notes: Includes bibliographical references (p. 47-50).

NAL Call #: TD427.N87-F33-2000; ISBN: 1569731977

<http://www.wri.org/water/nutrient.html>

Descriptors: Nutrient pollution of water---United States/ Water quality management---United States

This citation is from AGRICOLA.

**59. Furthering 'beyond-compliance' programs.**

Linett, B.; Hartig, J. H.; Wise, P. L.; Mehan, G. T.; Tosine, H. M.; and Gulezian, G.

*Water Environment and Technology* 10 (11): 63-68. (1998)

NAL Call #: TD419.W37; ISSN: 1044-9493

Descriptors: Environmental programs/ Water quality/ Water pollution/ Pollution prevention/ Great Lakes

This citation is from AGRICOLA.

**60. Green evolution: Are economic incentives the next step in nonpoint source pollution control?**

Young, T. F. and Karkoski, J.

*Water Policy* 2 (3): 151-173. (2000); ISSN: 1366-7017

*Descriptors:* Agricultural pollution/ Government policies/ Water pollution control/ Economics/ Environmental incentives/ United States, California/ Water Quality Control/ Nonpoint Pollution Sources/ Agricultural Runoff/ Best Management Practices/ Pricing/ Costs/ Pollution control / Environmental protection/ Selenium/ Pollution legislation/ Pollution (Nonpoint sources)/ Runoff (Agricultural)/ Charges/ Costs/ United States, California/ incentives/ Environmental action/ Water quality control/ Protective measures and control/ Water Quality

*Abstract:* Pollution from agriculture remains one of the United States' most vexing water pollution problems. Conventional wisdom asserts that agricultural pollution control is best accomplished using voluntary 'Best Management Practices', and that quantitative discharge limits and economic incentives are impractical. Recent experience in California demonstrates otherwise. Here, quantitative limits on selenium discharges have been imposed on a regional consortium of farm districts. The consortium has developed a relatively streamlined institutional system that uses tradable discharge permits to enforce the limits. Individual districts use tiered water pricing and other mechanisms to control discharges. Agricultural pollution from the region has decreased.  
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**61. Green payments for nonpoint pollution control.**

Horan, R. D.; Shortle, J. S.; and Abler, D. G.

*American Journal of Agricultural Economics* 81 (5): 1210-1215. (1999)

*NAL Call #:* 280.8-J822; ISSN: 0002-9092 [AJAEB].

*Notes:* Paper presented at the annual meeting of the American Agricultural Economics Association, August 8-11, 1999, Nashville, Tennessee. Includes references.

*Descriptors:* pollution control/ incentives/ federal programs/ support measures/ environmental protection/ water quality/ United States/ Clean Water Action Plan  
This citation is from AGRICOLA.

**62. Has the time come to regulate farmers: We already do, but how do we decide what is enough, how clean is clean.**

Allee, D. J. and Dworsky, L. B.

*Water Resources Update* (88): 21-22. (1992)

*NAL Call #:* TD201.U61.

*Notes:* Special issue on the Clean Water Act.

*Descriptors:* Agricultural management/ Environmental Policy/ Clean Water Act/ Pollution control/ Nonpoint source pollution/ Water quality  
This citation is from AGRICOLA.

**63. Implementing domestic tradable permits for environmental protection.**

Organisation for Economic Co-operation and Development.

Paris, France : Organisation for Economic Co-operation and Development.

252 p. : col. ill. (1999)

*Notes:* Includes bibliographical references.; ISBN: 9264170227

*Descriptors:* Emissions trading/ Environmental policy/ Economic aspects/  
OECD countries/ Environmental Protection

This citation is from AGRICOLA.

**64. Incentive based conservation policy and the changing role of government.**

Sohngen, Brent

DeKalb, Illinois.: American Farmland Trust Center for Agriculture in the Environment.  
(1998)

*Notes:* Center for Agriculture in the Environment Working Paper Series: CAE/WP98-6.

NAL Call #: HD256-.W67-no.-98-6

<http://www.aftresearch.org/researchresource/wp/wp98-6.html>

*Descriptors:* Environmental policy/ Water quality/ Economics/ United States

This citation is from AGRICOLA.

**65. Increasing regulators' confidence in point-nonpoint pollutant trading schemes.**

Taff, S. J. and Senjem, N.

*Water Resources Bulletin* 32 (6): 1187-1193. (Dec. 1996)

NAL Call #: 292.9-Am34; ISSN: 0043-1370 [WARBAQ].

*Notes:* Includes references.

*Descriptors:* water pollution/ point sources/ pollutants/ pollution control/ watershed management/ water quality/ costs/ regulation/ uncertainty/ Oregon/ nonpoint sources/ water quality uncertainty/ practice uncertainty/ enforcement uncertainty/ price uncertainty

*Abstract:* One of the principal stumbling blocks to regulatory agencies' adopting pollutant trading schemes is the complex of uncertainties surrounding any change in institutions. This is especially true if nonpoint pollution sources are to be involved along with point sources. Regulators are understandably reluctant to switch from tried-and-true point source permit systems, even if trading schemes can be shown (on paper, at least) to result in lower public expenditures. We propose a set of practical criteria for point- nonpoint pollutant trading systems that promise to increase regulators' confidence that the new system will be equally effective in controlling pollution and at the same time more likely to capture efficiencies in pollution reduction practices.

This citation is from AGRICOLA.

**66. Innovative Water Quality-Based Permitting: A Policy Perspective.**

Downing, D. and Sessions, S.

*Journal of the Water Pollution Control Federation* 57 (5): 358-365. (1985)

NAL Call #: TD419.R47

*Descriptors:* Water quality/ Pollution control/ Water pollution/ Nonpoint source pollution/  
Environmental programs

This citation is from AGRICOLA.

**67. International trading arrangements, the intensity of resource use, and environmental quality.**

Young, M. D.

In: Agriculture and water quality: International perspectives/ Braden, J. B. and Lovejoy, S. B.

L. Rienner: Boulder, Colo., 1989; pp. 197-215.

*Notes:* Includes references.

*NAL Call #:* HC79.W32A37

*Descriptors:* international trade/ environmental policy

This citation is from AGRICOLA.

**68. Lessons learned about the performance of USDA agricultural nonpoint source pollution programs.**

Ribaudo, M. O.

*Journal of Soil and Water Conservation* 53 (1): 4-10. (1998)

*NAL Call #:* 56.8-J822; *ISSN:* 0022-4561 [JSWCA3].

*Notes:* Includes references.

*Descriptors:* water quality/ water pollution/ pollution control/ environmental protection/ federal programs / USDA/ program evaluation/ United States

This citation is from AGRICOLA.

**69. Managing the Water Environment: Prospects for Change.**

Zabel, T. and Rees, Y.

*Water Law* 9 (5-6): 195-203. (1999); *ISSN:* 0959-9754

*Descriptors:* Effluents/ Economics/ Environmental programs/ Water pollution/ United Kingdom

This citation is from AGRICOLA.

**70. A new tool for water quality: Making watershed-based trading work for you.**

National Wildlife Federation.

Montpelier, Vt.: National Wildlife Federation. (1999)

*Notes:* Title from title page of source code document. "June 1999"

Includes bibliographical references.

*NAL Call #:* TD365-.N48-1999

<http://www.nwf.org/watersheds/pdf%5Fdocuments/newtool.pdf>

*Descriptors:* Water quality management/ Watershed management

This citation is from AGRICOLA.

**71. Nonpoint pollution policies and politics: The role of economic incentives.**

Braden, J. B.

*American Water Resources Association Technical Publication Series (TPS)* (88-4): 57-65. (Nov. 1988)

*NAL Call #:* TC401.A5; *ISSN:* 0066-1171.

*Notes:* In the series analytic: Nonpoint pollution: 1988--policy, economy, management, and appropriate technology / edited by V. Novotny. Includes references.



*Descriptors:* pollution by agriculture/ water pollution/ environmental pollution/ control/ programs/ environmental policy/ incentives/ subsidies/ abatement subsidies/ transferable discharge permits  
This citation is from AGRICOLA.

**72. Nonpoint sources.**

Line, D. E.; McLaughlin, R. A.; Osmond, D. L.; Jennings, G. D.; Harman, W. A.; Lombardo, L. A. ; and Spooner, J.

*Water Environment Research* 70 (4): 895-912. (June 1998)

*NAL Call #:* TD419.R47; *ISSN:* 1061-4303 [WAERED].

*Notes:* Includes references.

*Descriptors:* water pollution/ groundwater pollution/ pollutants/ pesticide residues/ leaching/ runoff/ pollution control/ low input agriculture/ best management practices/ nonpoint source pollution

*Abstract:* Annual literature review covers multiple aspects of nonpoint source pollution and includes references to articles on pollution trading.

This citation is from AGRICOLA.

**73. Nonpoint sources.**

Line, D. E.; Jennings, G. D.; McLaughlin, R. A.; Osmond, D. L.; Harman, W. A.; Lombardo, L. A. ; Tweedy, K. L.; and Spooner, J.

*Water Environment Research* 71 (5): 1054-1069. (Aug. 1999)

*NAL Call #:* TD419.R47; *ISSN:* 1061-4303 [WAERED].

*Notes:* Includes references.

*Descriptors:* water pollution/ groundwater pollution/ groundwater/ surface water/ water quality/ pollutants/ runoff/ leaching/ agricultural land/ agricultural chemicals/ pollution control/ literature reviews/ nonpoint source pollution/ best management practices

*Abstract:* Annual literature review covers multiple aspects of nonpoint source pollution and includes references to articles on pollution trading.

This citation is from AGRICOLA.

**74. Optimizing point/nonpoint source tradeoff in the Holston River near Kingsport, Tennessee.**

Podar, M. K.; Jaksch, J. A.; Sessions, S. L.; Crossman, J. C.; Ruane, R. J.; Hauser, G.; and Burmaster, D. E.

In: Perspectives on nonpoint source pollution: Proceedings of a national conference. (Held 19 May 1985-22 May 1985 at Kansas City, Missouri.)

Washington, D.C.: U.S. Environmental Protection Agency, Office of Water Regul and Standards; pp. 417-424 ; 1985.

*Notes:* Includes references.

*NAL Call #:* TD223.P39

*Descriptors:* river water/ water pollution/ point source/ pollution by agriculture/ waste disposal/ biological oxygen demand/ waste water treatment/ simulation models/ Tennessee

This citation is from AGRICOLA.

**75. Options for agricultural nonpoint-source pollution control.**

Ribaudo, M. O.

*Journal of Soil and Water Conservation* 47 (1): 42-46. (Jan. 1992-Feb. 1992)

NAL Call #: 56.8-J822; ISSN: 0022-4561 [JSWCA3].

Notes: Includes references.

Descriptors: pollution/ control/ pollution control/ water pollution/ drainage/ leaching/ runoff/ pesticides/ sediment/ soil conservation/ land policy/ USDA/ land banks/ federal programs/ United States

This citation is from AGRICOLA.

**76. Point-nonpoint effluent trading in watersheds: A review and critique.**

Jarvie, M. and Solomon, B.

*Environmental Impact Assessment Review* 18 (2): 135-157. (1998)

NAL Call #: TD194.6.E56; ISSN: 0195-9255

Descriptors: Watersheds/ Water pollution/ Environmental policies/ Economics/ Nonpoint source pollution

This citation is from AGRICOLA.

**77. Point-nonpoint nutrient trading in the Susquehanna River basin.**

Horan, R. D.; Shortle, J. S.; and Abler, D. G.

*Water Resources Research* 38 (5): 8-1-8/13. (2002)

NAL Call #: 292.8-W295; ISSN: 0043-1397

Descriptors: Water quality/ Nonpoint source pollution/ Pollution load/ Environmental programs/ Market development/ Economics

This citation is from AGRICOLA.

**78. Point/nonpoint source pollution reduction trading: An interpretive survey.**

Letson, D.

*Natural Resources Journal* 32 (2): 219-232. (Spring 1992)

NAL Call #: HC79.E5N3; ISSN: 0028-0739 [NRJOA].

Notes: Includes references.

Descriptors: water pollution/ cost control/ literature reviews/ United States

This citation is from AGRICOLA.

**79. Point-nonpoint source trading for managing agricultural pollutant loadings: Prospects for coastal watersheds.**

Letson, David.; Crutchfield, Stephen R.; Malik, Arun S.; and United States. Dept. of Agriculture. Economic Research Service.

Washington, DC: U.S. Dept. of Agriculture, Economic Research Service; vii, 14 p. : ill., map. (1993)

Notes: Cover title. "September 1993"--P. [iii]. "Water quality."

Includes bibliographical references (p. 13-14).

NAL Call #: A281.9-Ag8A-no.674

Descriptors: Water quality management---United States/ Agricultural pollution---United States/ Nonpoint source pollution---United States

This citation is from AGRICOLA.

**80. Point-Nonpoint Source Trading: Looking beyond Potential Cost Savings.**

Bartfeld, E.

*Environmental Law* 23 (1): 43-106. (1993)

*Descriptors:* Environmental policy/ Laws and regulations/ Water quality/  
Water pollution/ Nonpoint source pollution/ Pollution prevention/ Economics

This citation is from AGRICOLA.

**81. Point/nonpoint source trading program for Dillon Reservoir and planned extensions for other areas.**

Elmore, T.; Jaksch, J.; and Downing, D.

In: Perspectives on nonpoint source pollution: Proceedings of a national conference. (Held 19 May 1985-22 May 1985 at Kansas City, Missouri.)

Washington, D.C.: U.S. Environmental Protection Agency, Office of Water Regulations and Standards; pp. 413-416.; 1985.

*Notes:* Includes references.

*NAL Call #:* TD223.P39

*Descriptors:* water reservoirs/ water pollution/ point source/ pollution by agriculture/  
control/ programs/ water composition and quality/ monitoring/ Colorado

This citation is from AGRICOLA.

**82. Point Sources-Nonpoint Sources Trading in the Lake Dillon Watershed: A final report.**

Northwest Colorado Council of Governments

Frisco, Colo.: Northwest Colorado Council of Governments. (1984)

*Notes:* Final Report 1984. 45 p.

*Descriptors:* Nonpoint source pollution/ Wastewater treatment/ Water pollution/  
Phosphorus/ Eutrophication/ Water quality trading

This citation is from AGRICOLA.

**83. Policy objectives and economic incentives for controlling agricultural sources of nonpoint pollution.**

Horan, R. D. and Ribaud, M. O.

*Journal of the American Water Resources Association* 35 (5): 1023-1035. (Oct. 1999)

*NAL Call #:* GB651.W315; *ISSN:* 1093-474X [JWRAF5]

*Descriptors:* agriculture/ water pollution/ pollution control/ water quality/ economics/  
incentives/ policy/ costs/ USDA/ United States

*Abstract:* In this paper, we review the physical characteristics of agricultural nonpoint pollution and discuss the implications for setting appropriate pollution control objectives and designing incentive-based pollution control policies. First, we discuss that policy objectives must be designed carefully to ensure positive economic net benefits can be expected from pollution control. Next, we review several classes of incentives and recommend the use of design-based incentives (i.e., incentives based on variable input use, management practices, and land use) for controlling nonpoint pollution. Cost-effectiveness requires that incentives elicit three types of responses from farmers: (1) use variable inputs at appropriate levels, (2) adopt appropriate management practices, and (3) make appropriate land use decisions at the extensive margin of production. If a set of incentives fails to induce the correct responses, the resulting runoff levels and

hence ambient pollution levels and damages will be too large relative to policy goals. A review of existing programs suggests that greater program coordination and improved targeting of incentives are needed for further water quality improvements. Alternatively, properly designed market-based systems may be effective alternatives. These systems would reduce overall pollution control costs by allowing markets to allocate point source and nonpoint source control costs more efficiently.

This citation is from AGRICOLA.

**84. Pollution Permits and Markets for Water Quality.**

O'Neill, W. B.

Madison, Wisc.: University of Wisconsin, 1980.

*Notes:* PhD Thesis

*Descriptors:* Water pollution/ Water quality/ Models/ Program planning/ Economics

This citation is from AGRICOLA.

**85. Pronsolino v. Marcus.**

Shosteck, D.

*Ecology Law Quarterly* 28 (2): 327-354. (2001); ISSN: 0046-1121

*Descriptors:* Water pollution/ Nonpoint source pollution/ Water quality/ Clean Water Act/ Pollution load/ Laws and regulations/ Environmental protection/ Environmental policy/ total maximum daily load

This citation is from AGRICOLA.

**86. The regulation of water pollution permit trading under conditions of varying streamflow and temperature Wisconsin permit market system, Transferable Discharge Permits.**

O'Neil, W. B.

*Land Economics* 6: 219-231. (1983)

*NAL Call #:* HD1401.L3; *ISSN:* 0075-7837.

*Notes:* Includes references.

*Descriptors:* Wisconsin

This citation is from AGRICOLA.

**87. The role of education in nonpoint source pollution control policy.**

Ribaudo, M. O. and Horan, R. D.

*Review of Agricultural Economics* 21 (2): 331-343. (Fall 1999-Winter 1999)

*NAL Call #:* HD1773.A3N6; *ISSN:* 1058-7195.

*Notes:* Includes references.

*Descriptors:* water quality/ water pollution/ pollution control/ educational programs/ program evaluation/ profitability/ environmental policy/ United States

*Abstract:* Education is often used to provide producers with information on how to operate more efficiently with current technologies or on profitable new technologies that generate less pollution. While such "win-win" solutions to water quality problems are attractive, we use a simple economic framework to show that education cannot be considered a strong tool for water quality protection. Its success depends on a number

of factors related to profitability and altruism, and "win-win" solutions are not always guaranteed, even when they appear to exist. Evidence suggests that net returns are the chief concern of producers when they adopt alternative management practices. This citation is from AGRICOLA.

**88. Search for the Northwest Passage: The assignment of NSP (non-point source pollution) rights in nutrient trading programs.**

Collentine, D.

*Water Science and Technology* 45 (9): 227-234. (2002)

NAL Call #: TD420.A1P7; ISSN: 0273-1223.

Notes: Special issue on Diffuse/Non-point Pollution and Watershed Management.

Descriptors: Nonpoint source pollution/ Water Pollution/ Water quality standards/ Environmental policy/ Pollution load/ Law and legislation/ Water Quality

This citation is from AGRICOLA.

**89. Simulation of a two-pollutant, two-season pollution offset system for the Colorado River of Texas below Austin.**

Letson, D.

*Water Resources Research* 28 (5): 1311-1318. (May 1992)

NAL Call #: 292.8-W295; ISSN: 0043-1397 [WRERA0].

Notes: Includes references.

Descriptors: river water/ water pollution/ pollutants/ water quality/ environmental impact/ seasonal variation/ simulation models/ mathematical models/ Texas/ pollution control

Abstract: A pollution offset system is a discharge permit system in which transfers are made subject to a restriction that no violations of water quality standards occur at any location. Simulation of a pollution offset system with seasonal variation and multiple pollutants allows for comparison of the savings possible from these design features. A simulation model (Qual-TX) developed by the Texas Water Commission is applied to a case study region near Austin, Texas, yielding impact coefficients for an economic optimization model without investment whose least cost solution represents the theoretical equilibrium of a pollution offset system. The optimization model finds short-run savings of 17.5% for a pollution offset system, as compared to a command and control policy that would also achieve the dissolved oxygen standard. Seasonal variation in permit design produces minimal effects; virtually all savings come from allowing pollution offsets for the two different pollutants.

This citation is from AGRICOLA.

**90. Theory and Practice of Pollution Credit Trading in Water Quality Management.**

Hoag, Dana L. and Hughes-Popp, Jennie S.

*Review of Agricultural Economics* 19 (2): 252-262. (1997)

NAL Call #: HD1773.A3N6; ISSN: 1058-7195

Descriptors: Economics/ Water quality/ Pollution control/ Environmental policy

This citation is from AGRICOLA.

**91. Trading between point and nonpoint sources: A cost effective method for improving water quality --- The case of Dillon Reservoir.**

Elmore, Tom and United States. Environmental Protection Agency. Office of Policy, Planning and Evaluation

Washington, D.C.: U.S. Environmental Protection Agency; 20 leaves: maps. (1984)

*Notes:* Presented at 57th WPCF Conference (New Orleans, La.); Cover title. "The work for this study was funded by a grant." Includes bibliographical references (leaf 20).

*NAL Call #:* TD224.C6T72

*Descriptors:* Water quality management---Colorado---Dillon Reservoir/  
Dillon Reservoir---Colorado

This citation is from AGRICOLA.

**92. Trading in the Tar-Pamlico.**

Hall, J. C. and Howett, C. M.

*Water Environment and Technology* 6 (7): 58-61. (1994)

*NAL Call #:* TD419.W37; *ISSN:* 1044-9493

*Descriptors:* Watershed management/ Water quality/ Nonpoint source pollution/  
Economics/ Laws and regulations

This citation is from AGRICOLA.

**93. Trading on water: Trading can be a cheaper answer to water quality problems, creating a win-win solution for all.**

Greenhalgh, Suzie and Faeth, Paul

*Forum for Applied Research and Public Policy* 16 (1): 71-77. (2001); *ISSN:* 0887-8218

*Descriptors:* Water quality/ Economics/ Environmental policy/ Water pollution/  
Pollution control/ United States

This citation is from AGRICOLA.

**94. Transferable Discharge Permit Trading under Varying Stream Conditions: A Simulation of Multiperiod Permit Market Performance on the Fox River, Wisconsin.**

O'Neil, W. B.

*Water Resources Research* 19 (3): 608-612. (1983)

*NAL Call #:* 292.8-W295

*Descriptors:* Water quality/ Water pollution/ Market development/ Economics/ Planning/  
Environmental programs

This citation is from AGRICOLA.

**95. Transferable Discharge Permits and Economic Efficiency: The Fox River.**

O'Neill, W.; David, M.; Moore, C.; and Joeres, E.

*Journal of Environmental Economics and Management* 10: 346-355. (1983)

*NAL Call #:* HC79.P55J6

*Descriptors:* Water quality/ Economics/ Simulation models/ Water pollution/  
Pollution control

This citation is from AGRICOLA.

**96. The U.S. environmental policy experience: A critique with suggestions for the European community.**

Howe, C. W.

*Environmental and Resource Economics* 3 (4): 359-379. (1993); ISSN: 0924-6460

*Descriptors:* Environmental policy/ United States/ Water quality/ Economics

This citation is from AGRICOLA.

**97. Using historical biological data to evaluate status and trends in the Big Darby Creek Watershed (Ohio, USA).**

Schubauer Berigan, M. K.; Smith, M.; Hopkins, J.; and Cormier, S. M.

*Environmental Toxicology and Chemistry* 19 (4,pt.2): 1097-1105. (2000)

*NAL Call #:* QH545.A1E58; *ISSN:* 0730-7268 [ETOC DK].

*Notes:* In the Special Issue: Ecosystem Vulnerability. Paper presented at the American Society for Testing and Materials-U.S. Environmental Protection Agency-Society of Environmental Toxicology and Chemistry Symposium, August 17-20, 1998, Seattle, Washington. Includes references.

*Descriptors:* watersheds/ watershed management/ biological indicators/ trends/ Ohio

*Abstract:* Assessment of watershed ecological status and trends is challenging for managers who lack randomly or consistently sampled data, or monitoring programs developed from a watershed perspective. This study investigated analytical approaches for assessment of status and trends using data collected by the Ohio Environmental Protection Agency as part of state requirements for reporting stream quality and managing discharge permits. Fish and benthic macroinvertebrate metrics collected during three time periods (1979-1981, 1986-1989, 1990-1993) were analyzed for the mainstem of Big Darby Creek, a high-quality warm-water stream in central Ohio, USA. Analysis of variance of transformed metrics showed significant differences among time periods for six fish metrics. In addition, significant positive linear trends were observed for four metrics plus the index of biotic integrity score, and negative linear trends for two fish metrics. An analysis of a subset of sites paired by location and sampled over the three periods reflected findings using all available data for the mainstem. In particular, mean estimates were very similar between the reduced and full data sets, whereas standard error estimates were much greater in the reduced subset. Analysis of serial autocorrelation patterns among the fish metrics over the three time periods suggests changes in the nature of stressors over time. A comparison within the most recent time period showed significantly better condition for Big Darby mainstem than for Hellbranch Run (the easternmost subwatershed), after adjusting for watershed size. The consistency of paired and nonrandomized results suggested that either type of data might be judiciously used for this watershed assessment. Results indicated that overall biological condition of the mainstem of the Big Darby Creek watershed has significantly improved since the early 1980s.

This citation is from AGRICOLA.

**98. Using Market Incentives to Protect Water Quality in America.**

Willey, Z.

*Water Resources Update* (88): 43-51. (1992)

NAL Call #: TD201.U61.

Notes: Special issue on the Clean Water Act.

Descriptors: Water quality/ Economics/ Pollution control/ Nonpoint source pollution/  
Water quality standards/ Environmental fate

This citation is from AGRICOLA.

**99. Water pollution: Pollutant trading could reduce compliance costs if uncertainties are resolved --- Report to the Chairman, Committee on Public Works and Transportation, House of Representatives.**

United States. General Accounting Office and United States. Congress. House. Committee on Public Works and Transportation.

Washington, D.C.: U.S. General Accounting Office; 15 p. (1992)

Notes: Cover title. "June 1992." "GAO/RCED-92-153." "B-247972.2"--P. 1.

Includes bibliographical references. SUDOCS: GA 1.13:RCED-92-153.

NAL Call #: TD420.U542-1992

Descriptors: United States Environmental Protection Agency---Auditing/  
Water Pollution---United States---Prevention---Cost control/ Water Pollution---  
Government policy---United States

This citation is from AGRICOLA.

**100. Water quality impacts of biochemical oxygen demand under transferable discharge permit programs [Delaware River estuary and Willamette River].**

Brill, E. D. Jr.; Eheart, J. W.; Kshirsagar, S. R.; and Lence, B. J.

*Water Resources Research* 20 (4): 445-455. (Apr. 1984)

NAL Call #: 292.8-W295; ISSN: 0043-1397 [WRERA].

Notes: Includes references.

Descriptors: water composition and quality/ waste water disposal/ transfers/  
regulations/ environmental assessment/ water management/ United States/ rivers/  
Delaware

This citation is from AGRICOLA.

**101. Water Quality Management Simulation Game.**

Chiang, Shin An.

Stillwater, Okla.: Oklahoma State University; 158 p. (1986)

Notes: Thesis (Ph. D.); Includes bibliographic references.

Descriptors: Water quality/ Water quality standards/ Pollution load/ Simulation models/  
Cost analysis

This citation is from AGRICOLA.



**102. Watershed-Based Effluent Trading: The Nonpoint Source Challenge.**

Stephenson, Kurt; Norris, Patricia; and Shabman, Leonard.

*Contemporary Economic Policy* 16 (4): 412-421. (1998)

NAL Call #: HD72.C6; ISSN: 1074-3529

*Descriptors:* Economics/ Water quality/ Pollution control/ Environmental policy

This citation is from AGRICOLA.

**103. Watershed-based permitting: Wave of the future of water quality management.**

Galya, D.; Mitchell, D.; and Gerath, M.

*Environmental Regulation and Permitting* 7 (4): 61-66. (1998); ISSN: 1083-6624

*Descriptors:* Watersheds/ Economics/ Water quality/ Pollution control/

Environmental policy

This citation is from AGRICOLA.

**104. Watershed-based Pollution trading Development and Current Trading Programs.**

McGinnis, S. L.

*Environmental Engineering and Policy* 2 (3): 161-170. (2001); ISSN: 1433-6618

*Descriptors:* Watersheds/ Water quality/ Water Pollution/ Environmental policy/

Water quality standards/ Watershed management

This citation is from AGRICOLA.

**105. The welfare sensitivity of agri-environmental instruments.**

Horan, R. D.; Claassen, R.; and Howe, L.

*Journal of Agricultural and Resource Economics* 26 (2): 368-386. (Dec. 2001)

NAL Call #: HD1750.W4; ISSN: 1068-5502.

*Notes:* Includes references.

*Descriptors:* pollution control/ environmental policy/ emission/ simulation/ welfare economics/ mathematical models/ uncertainty/ comparisons/ efficiency/ social benefits/ fertilizers/ runoff/ statistical analysis

This citation is from AGRICOLA.